lowest 10 percent earned less than $6.93 and the highest 10 percent earned more than $15.62 an hour.

Median hourly earnings of transportation equipment painters were $14.00 in 1998. The middle 50 percent earned between $10.86 and $18.95 an hour. The lowest 10 percent earned less than $8.50 and the highest 10 percent earned more than $23.37 an hour. Median hourly earnings of transportation equipment painters in 1997 were $13.30 in automotive repair shops and $15.50 in motor vehicle and equipment manufacturing.

Many automotive painters employed by motor vehicle dealers and independent automotive repair shops receive a commission based on the labor cost charged to the customer. Under this method, earnings depend largely on the amount of work a painter does and how fast it is completed. Employers frequently guarantee commissioned painters a minimum weekly salary. Helpers and trainees usually receive an hourly rate until they become sufficiently skilled to work on commission. Trucking companies, bus lines, and other organizations that repair and refinish their own vehicles usually pay by the hour.

Many painting and coating machine operators belong to unions. Most union operators work for manufacturers and the larger motor vehicle dealers.

Related Occupations

Other occupations in which workers apply paints and coatings include construction and maintenance painters, electrolytic metal platers, and hand painting, coating, and decorating occupations.

Sources of Additional Information

For more details about work opportunities, contact local manufacturers, automotive-body repair shops, motor vehicle dealers, and vocational schools; locals of unions representing these workers; or the local office of the State employment service. The State employment service also may be a source of information about training programs.

Information on how to become a certified automotive painter is available from:

☛ National Institute for Automotive Service Excellence (ASE), 13505 Dulles Technology Dr., Suite 2, Herndon, VA 20171-3421. Internet: **http://www.asecert.org**

Photographic Process Workers

(O*NET 89914A, 89914B, 89914C, 89914D, and 92908)

Significant Points

- Employment opportunities for photographic process workers are expected to decline as digital photography becomes commonplace.
- Most photographic process workers receive on-the-job training from their companies, manufacturers' representatives, and experienced workers.

Nature of the Work

Both amateur and professional photographers rely heavily on photographic process workers to develop film, make prints or slides, and do related tasks, such as enlarging or retouching photographs. *Photographic processing machine operators and tenders* operate various machines, such as mounting presses and motion picture film printing, photographic printing, and film developing machines. *Precision photographic process workers* perform more delicate tasks, such as retouching photographic negatives and prints to emphasize or correct specific features.

Photographic processing machine operators and tenders often have specialized jobs. *Film process technicians* operate machines that develop exposed photographic film or sensitized paper in a series of chemical and water baths to produce negative or positive images. First, technicians mix developing and fixing solutions, following a formula. They then load the film in the machine, which immerses the exposed film in a developer solution. This brings out the latent image. The next steps include immersing the negative in a stop-bath to halt the developer action, transferring it to a hyposolution to fix the image, and then immersing it in water to remove the chemicals. The photographic process worker then dries the film. In some cases, these steps are performed by hand.

Color printer operators control equipment that produces color prints from negatives. These workers read customer instructions to determine processing requirements. They load film into color printing equipment, examine negatives to determine equipment control settings, set controls, and produce a specified number of prints. Finally, they inspect the finished prints for defects, remove any that are found, and insert the processed negatives and prints into an envelope for return to the customer.

Paper process technicians develop strips of exposed photographic paper; *takedown sorters* sort processed film; and *automatic mounters* operate equipment that cuts and mounts slide film into individual transparencies.

Precision photographic process workers, sometimes known as *digital imaging technicians*, use computer images of conventional negatives and specialized computer software to vary the contrast of images, remove unwanted background, or combine features from different photographs. The use of computers and digital technology is replacing much manual work, but some precision photographic process

Photographic process workers develop film, make prints or slides, and enlarge or retouch photographs.

workers who work in portrait studios still perform many specialized tasks by hand directly on the photo or negative: *airbrush artists* restore damaged and faded photographs, and may color or shade drawings to create photographic likenesses using an airbrush; *photographic retouchers* alter photographic negatives, prints, or images to accentuate the subject; *colorists* apply oil colors to portrait photographs to create natural, lifelike appearances; and *photographic spotters* remove imperfections on photographic prints and images.

Working Conditions

Photographic process workers generally spend their work hours in clean, appropriately lighted, well-ventilated, and air-conditioned offices, photofinishing laboratories, or 1-hour minilabs. In recent years, more commercial photographic processing has been done on computers than in darkrooms; and this trend is expected to continue. At peak times, portrait studios may hire individuals who work outside the studio to retouch negatives.

Photographic process machine operators must do repetitive work at a rapid pace without any loss of accuracy. Precision process workers do detailed tasks, such as airbrushing and spotting, which can contribute to eye fatigue.

Some photographic process workers are exposed continuously to the chemicals and fumes associated with developing and printing. These workers must wear rubber gloves and aprons and take precautions against these hazards.

Many photo laboratory employees work a 40-hour week, including weekends, and may work overtime during peak seasons.

Employment

Photographic process workers held about 63,000 jobs in 1998; almost three quarters of the jobs were for machine operators and tenders. Photofinishing laboratories and 1-hour minilabs employed about two-thirds. About 1 out of 7 worked for portrait studios and commercial laboratories that specialize in processing the work of professional photographers for advertising and other industries.

Employment fluctuates somewhat over the course of the year. Typically, employment peaks during school graduation and summer vacation periods, and again during the winter holiday season.

Training, Other Qualifications, and Advancement

Most photographic process workers receive on-the-job training from their companies, manufacturers' representatives, and experienced workers. New employees gradually learn to use the machines and chemicals that develop and print film.

Employers prefer applicants who are high school graduates or those who have some experience in the field. Computer skills; proficiency in mathematics, art, and chemistry; and photography courses that include instruction in film processing are all valuable preparation for precision work. Such courses are available through high schools, vocational-technical institutes, private trade schools, and colleges and universities.

On-the-job training in photographic processing occupations can range from just a few hours for print machine operators to several months for precision workers like airbrush artists and colorists. Some workers attend periodic training seminars to maintain a high level of skill. Manual dexterity, good hand-eye coordination, and good vision, including normal color perception, are important qualifications for precision photographic process workers. They must also be comfortable with computers and able to adapt to technological advances.

Photographic process machine workers can sometimes advance from jobs as machine operators to supervisory positions in laboratories or to management positions within retail stores.

Job Outlook

Overall employment of photographic process workers is expected to decline through the year 2008. Most openings will result from replacement needs, which tend to be higher for machine operators than for precision process workers.

In recent years, the use of digital cameras, which use electronic memory rather than film to record images, has grown rapidly among professional photographers and advanced amateurs. As the cost of digital photography drops, the use of such cameras will become more widespread among amateur photographers, reducing the demand for traditional photographic processing machine operators and tenders. However, conventional cameras, which use film to record images, are expected to continue to be the camera of choice among most casual photographers. Population growth and the popularity of amateur and family photography will contribute to an ongoing need for photographic process workers to process the film used in conventional cameras. This need will prevent what otherwise would be an even larger decline in the numbers of these workers.

Digital cameras and imaging are also expected to reduce the need for precision photographic process workers. Using digital technology, consumers who have a personal computer and the proper software will be able to download and view pictures on their computer, as well as manipulate, correct, and retouch their own photographs. No matter what improvements occur in camera technology though, there will be some precision processing tasks that require skillful manual treatment. Portrait studios, in particular, will continue to use colorists and airbrush artists, who work directly on actual photographs or negatives.

Earnings

Earnings of photographic process workers vary greatly depending on skill level, experience, and geographic location. Median hourly earnings for precision photographic process workers in 1998 were $10.39. The middle 50 percent earned between $7.69 and $13.20. The lowest 10 percent earned less than $6.15 and the highest 10 percent earned more than $18.49.

Median hourly earning for photographic processing machine operators and tenders in 1998 were $8.56. The middle 50 percent earned between $7.08 and $10.96. The lowest 10 percent earned less than $6.05 and the highest 10 percent earned more than $14.84. Median hourly earning in the industries employing the largest number of photographic processing machine operators and tenders in 1997 are shown below:

Miscellaneous business services	$8.30
Photographic studios, portrait	8.00

Precision photographic process workers generally earn more as their skill level and the complexity of the tasks they perform increase.

Related Occupations

Precision photographic process workers need a specialized knowledge of the photodeveloping process. Other workers who apply specialized technical knowledge include chemical laboratory technicians, crime laboratory analysts, food testers, medical laboratory assistants, metallurgical technicians, quality control technicians, engravers, and some of the printing occupations, such as photolithographer.

Photographic process machine operators perform work similar to that of other machine operators, such as computer, peripheral equipment, and printing press operators.

Sources of Additional Information

For information about employment opportunities in photographic laboratories and schools that offer degrees in photographic technology, contact:

☛ Photo Marketing Association International, 3000 Picture Place, Jackson, MI 49201.